

Summer Work Packet for MPH Math Classes

**Students going into
Algebra II/Trig
Sept. 2018**

Name: _____

This packet is designed to help students stay current with their math skills.

Each math class expects a certain level of number sense, algebra sense and graph sense in order to be successful in the course.

These problems need to be completed in the space provided, or a separate sheet of paper, by the first day of class. Be sure to show all work.

Students can expect this packet to be graded, and/or to have a test on this material during the first marking period. If you have any questions, please email Mrs. Reeve at sreeve@mphschool.org.

Name _____

Solve each equation for the given variable. CHECK your answer.

1. $12x - 1 = 6x + 2$

2. $4(3x - 2) = 12x - 8$

3. $4z = 2(1 + 2z)$

4. $\frac{x+5}{7} = \frac{5}{3}$

5. $\frac{2x-1}{9} = \frac{x-2}{5}$

**Graph the following points on graph paper. Draw a line through the points.
Find the slope of the line.
Label the coordinates of the x-intercept and y-intercept.**

6. (5, 11) and (3, 7)

7. (-4, 8) and (-3, 4)

Write the equation of the line with the given information.

8. $m = \frac{1}{2}$ and going through the point (0, -3)

9. $m = 5$ and going through the point (-3, 4)

10. $m = \frac{2}{3}$ and going through the point (9, -1)

Graph the lines on graph paper. Find the slope and the y-intercept of each. Find the coordinates of the point of intersection. CHECK the point in both equations.

11. $y = 3x - 2$ and $y = \frac{1}{2}x + 3$ Intersection point: _____

slope: _____ slope: _____ CHECK:

y-int.: _____ y-int.: _____

RULES FOR SIMPLIFYING RADICALS (square roots)

$$a\sqrt{b} \cdot c\sqrt{d} = ac\sqrt{bd} \quad \frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}} \quad \sqrt{a} \cdot \sqrt{a} = \sqrt{a^2} = |a|$$

$$a\sqrt{b} + c\sqrt{b} = (a + c)\sqrt{b}$$

Remember, proper form for radicals means:

a. No perfect square factor under the radical. For example, $\sqrt{45} = \sqrt{9} \cdot \sqrt{5} = 3\sqrt{5}$

b. No fractions/decimals may be left under the radical. For example, $\sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}} = \frac{\sqrt{3}}{2}$

c. No radical may be left in the denominator of a fraction. For example,

$$\sqrt{\frac{3}{7}} = \frac{\sqrt{3}}{\sqrt{7}} = \frac{\sqrt{3}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{21}}{7}. \text{ Another example, } \frac{15\sqrt{75}}{20\sqrt{21}} = \frac{3\sqrt{25}\sqrt{3}}{4\sqrt{7}\sqrt{3}} = \frac{3 \cdot 5}{4\sqrt{7}} = \frac{3 \cdot 5 \cdot \sqrt{7}}{4\sqrt{7}\sqrt{7}} = \frac{15\sqrt{7}}{28}.$$

Simplify each. Leave in best radical form. NO DECIMAL EQUIVALENTS.

$$12. \frac{\sqrt{49}}{\sqrt{25}}$$

$$16. \frac{3}{\sqrt{13}}$$

$$13. \sqrt{28}$$

$$17. \frac{2\sqrt{5}}{\sqrt{81}}$$

$$14. 4\sqrt{75}$$

$$18. \sqrt{48} + \sqrt{27}$$

$$15. 7\sqrt{30} \cdot 2\sqrt{6}$$

Use the distributive property to expand the product. Follow the example.

EXAMPLE: $(x + 4)(x - 11) = x^2 - 11x + 4x - 44 = x^2 - 7x - 44$

19. $(x + 1)(x + 4)$

20. $(x - 3)(x - 6)$

21. $(x - 7)(x + 9)$

22. $(x + 5)(x - 4)$

23. $(3x - 1)(3x + 1)$

24. $(2x + 5)(x - 8)$

Factor each into the product of two binomials. Follow the example.

EXAMPLE: $3x^2 + 7x - 6 = (3x - 2)(x + 3)$

25. $x^2 + 4x + 3$

29. $x^2 - 10x + 24$

26. $k^2 + 6k + 9$

30. $x^2 + 11x + 24$

27. $x^2 - 12x + 36$

31. $x^2 + 10x - 24$

28. $t^2 - 25$

Factor each and solve for x. Follow the example.

EXAMPLE: $x^2 + 5x - 6 = 0$

$$(x + 6)(x - 1) = 0$$

$$(x + 6) = 0 \text{ OR } (x - 1) = 0$$

$$x = -6 \quad \text{OR} \quad x = 1$$

Factored and equal to 0

One of the factors must equal 0

Solve for x

32. $x^2 + 3x - 18 = 0$

35. $x^2 + 25x + 24 = 0$

33. $x^2 - 7x + 10 = 0$

36. $2x^2 - x - 10 = 0$

34. $x^2 - 25 = 0$

37. $x^2 + 25 = 10x$

Simplify the following polynomials by combining like terms:

38. $2(x - 5) + (5x + 2) + (8x + 1)$

39. $(x - 10) + 4(x + 7) - 2(x + 3)$

40. $(3y^2 - 8) + (5y + 9) - (y^2 + 6y - 4)$

41. $(9x^3 + 3x - 13) - (6x^2 - 5x) + (2x^3 - x^2 - 8x + 4)$

Draw and label a picture, then write an equation to solve the problems.

42. Two angles are supplementary. If the second angle is 30° more than twice the first angle, find the measure of each angle.

43. The lengths of the sides of parallelogram ABCD are $AB = 2x + 5$, $BC = 5x - 4$ and $CD = 6x - 7$. Find the value of x . What type of special parallelogram is ABCD?

44. The legs of a right triangle measure 16 and 30. Find the length of the hypotenuse.

45. In $\triangle ABC$, $\angle A = 3x - 20$, $\angle B = 6x + 15$ and $\angle C = x - 5$. Find the measure of the three angles.